



SEQUENCE LISTING

<110> Gordon-Kamm, William
Lowe, Keith
Sun, Yuejin
Dilkes, Brian
Larkins, Brian

<120> Cell Cycle Nucleic Acids, Polypeptides,
and Uses Thereof

<130> 1146

<160> 6

<170> FastSEQ for Windows Version 3.0

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<211> 1372
<212> DNA
<213> zea mays

<220>
<221> CDS
<222> (134)...(902)

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ggcgttgcgt cag atg ggg aag tac atg cgc aag tgc aag gcc gcc gca 169
Met Gly Lys Tyr Met Arg Lys Cys Arg Gly Ala Ala
1 5 10
ggc gcg gag gtc gcc gcc gtc gag gtt acg cag gtc gtc gcc gtc cgg 217
Gly Ala Glu Val Ala Ala Val Glu Val Thr Gln Val Val Gly Val Arg
15 20 25
acg agg tcc agg tcc gcg gcg gcg acc gcc ggt gtc gcg aag gtc gcc 265
Thr Arg Ser Arg Ser Ala Ala Thr Gly Gly Val Ala Lys Val Ala
30 35 40
ccg agg agg aag agg gcg ccg gcg ggg gag cct gct gcc gcc gtg agc 313
Pro Arg Arg Lys Arg Ala Pro Ala Gly Glu Pro Ala Ala Ala Val Ser
45 50 55 60
gct ggt ggg gac gcc gga agc tgc tac atc cac ctg cgt agc cgc atg 361
Ala Gly Gly Asp Gly Gly Ser Cys Tyr Ile His Leu Arg Ser Arg Met
65 70 75
ctg ttc atg gca ccg cct cag ccg cag ccg tcg gtt gac tcg gtt ccg 409
Leu Phe Met Ala Pro Pro Gln Pro Gln Pro Ser Val Asp Ser Val Pro
80 85 90
acc ccg gtg gag gct gct gat gcc gct gca gga cag cag gcc gcg gcg 457

Thr	Pro	Val	Glu	Ala	Ala	Asp	Gly	Ala	Ala	Gly	Gln	Gln	Gly	Ala	Ala		
		95					100					105					
ctc	gcg	gcc	ggg	ctc	tcg	cgt	tgc	tcc	agc	acg	gcg	tcg	tcg	gtg	aac	505	
Leu	Ala	Ala	Gly	Leu	Ser	Arg	Cys	Ser	Ser	Thr	Ala	Ser	Ser	Val	Asn		
	110					115					120						
ttg	ggc	ttg	ggg	ggt	cag	cgc	ggg	agc	cac	acc	tgc	cgc	tcc	tac	gac	553	
Leu	Gly	Leu	Gly	Gly	Gln	Arg	Gly	Ser	His	Thr	Cys	Arg	Ser	Tyr	Asp		
	125				130					135					140		
gct	gca	gag	gct	ggc	ggg	gat	cac	gtc	ctg	gtg	gat	gtc	tcg	gcg	gcg	601	
Ala	Ala	Glu	Ala	Gly	Gly	Asp	His	Val	Leu	Val	Asp	Val	Ser	Ala	Ala		
				145					150					155			
agc	aac	tcc	ggg	agc	ggc	cca	gac	cgc	gag	agg	cga	gag	acg	acg	cca	649	
Ser	Asn	Ser	Gly	Ser	Gly	Pro	Asp	Arg	Glu	Arg	Arg	Glu	Thr	Thr	Pro		
			160					165					170				
tcg	agc	cgg	gcg	cac	ggc	gag	ctc	agc	gat	ctg	gag	tcg	gat	ctg	gcg	697	
Ser	Ser	Arg	Ala	His	Gly	Glu	Leu	Ser	Asp	Leu	Glu	Ser	Asp	Leu	Ala		
		175					180						185				
ggg	cac	aag	act	ggc	ccg	tcg	cta	ccg	gcg	gca	acg	ccg	gct	gcg	gag	745	
Gly	His	Lys	Thr	Gly	Pro	Ser	Leu	Pro	Ala	Ala	Thr	Pro	Ala	Ala	Glu		
	190					195					200						
ctg	atc	gtg	ccg	cca	gca	cac	gag	atc	cag	gag	ttc	ttc	gcc	gcc	gcc	793	
Leu	Ile	Val	Pro	Pro	Ala	His	Glu	Ile	Gln	Glu	Phe	Phe	Ala	Ala	Ala		
	205				210					215					220		
gag	gcg	gcc	cag	gcc	aag	cgc	lil	gct	tcc	agg	tac	aac	ttc	gac	ttc	841	
Glu	Ala	Ala	Gln	Ala	Lys	Arg	Phe	Ala	Ser	Lys	Tyr	Asn	Phe	Asp	Phe		
			225						230				235				
gtc	cgc	ggc	gtg	ccc	ctc	gac	gcc	ggc	ggc	cgg	ttc	gag	tgg	gcg	ccg	889	
Val	Arg	Gly	Val	Pro	Leu	Asp	Ala	Gly	Gly	Arg	Phe	Glu	Trp	Ala	Pro		
			240					245					250				
gtg	gtc	agc	atc	t	gaagcgagcg	tgcggtccggt	gcaaggtgaa	gctagaaaga								942	
Val	Val	Ser	Ile														
			255														
gaaaagatgc	ccccccccc	ccccccaac	aaacataacg	gagaagagaa	aaaccaaaca											1002	
attaagcagc	tttatatagc	ctaagctaac	caccaccatt	catctcgctc	aatgcatgc											1062	
cttgcttttc	tctggagcta	gcaggagcgt	agttattatt	tagtactact	ttacttattc											1122	
agaggttatc	ttgacccga	tagatcaatc	cgcttactgt	gtaatttctc	tcatgcatct											1182	
cttagatgga	gtttaatcgt	cttaatttat	tactgtacag	cagcttgstt	ggcttgcaaa											1242	
gaaagatctg	gtttgtctca	aaaaaaaaaa	aaaaaaaaaa	aaaaaaagg	cggccgctct											1302	
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 <213> zea mays

<220>
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 Ser Ala Ala Ala Thr Gly Gly Val Ala Lys Val Ala Pro Arg Arg Lys
 35 40 45
 Arg Ala Pro Ala Gly Glu Pro Ala Ala Ala Val Ser Ala Gly Gly Asp
 50 55 60
 Gly Gly Ser Cys Tyr Ile His Leu Arg Ser Arg Met Leu Phe Met Ala
 65 70 75 80
 Pro Pro Gln Pro Gln Pro Ser Val Asp Ser Val Pro Thr Pro Val Glu
 85 90 95
 Ala Ala Asp Gly Ala Ala Gly Gln Gln Gly Ala Ala Leu Ala Ala Gly
 100 105 110
 Leu Ser Arg Cys Ser Ser Thr Ala Ser Ser Val Asn Leu Gly Leu Gly
 115 120 125
 Gly Gln Arg Gly Ser His Thr Cys Arg Ser Tyr Asp Ala Ala Glu Ala
 130 135 140
 Gly Gly Asp His Val Leu Val Asp Val Ser Ala Ala Ser Asn Ser Gly
 145 150 155 160
 Ser Gly Pro Asp Arg Glu Arg Arg Glu Thr Thr Pro Ser Ser Arg Ala
 165 170 175
 His Gly Glu Leu Ser Asp Leu Glu Ser Asp Leu Ala Gly His Lys Thr
 180 185 190
 Gly Pro Ser Leu Pro Ala Ala Thr Pro Ala Ala Gln Leu Ile Val Pro
 195 200 205
 Pro Ala His Glu Ile Gln Glu Phe Phe Ala Ala Glu Ala Ala Gln
 210 215 220
 Ala Lys Arg Phe Ala Ser Lys Tyr Asn Phe Asp Phe Val Arg Gly Val
 225 230 235 240
 Pro Leu Asp Ala Gly Gly Arg Phe Glu Trp Ala Pro Val Val Ser Ile
 245 250 255

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 <212> DNA
 <213> zea mays

<220>
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 tcgaaaccct agcttgccca gcccctccgg gcc atg ggc aag tac atg cgc aag 174

	Met Gly Lys Tyr Met Arg Lys	
	1	5
gcc aag gct tcc agc gag gtt gtc atc atg gat gtc gcc gcc gct ccg	222	
Ala Lys Ala Ser Ser Glu Val Val Ile Met Asp Val Ala Ala Ala Pro		
10 15 20		
ctc gga gtc cgc acc cga gcg cgc gcc ctc gcg ctg cag cgt ctg cag	270	
Leu Gly Val Arg Thr Arg Ala Arg Ala Leu Ala Leu Gln Arg Leu Gln		
25 30 35		
gag cag cag acg cag tgg gag gaa ggt gct ggc ggc gag tac ctg gag	318	
Glu Gln Gln Thr Gln Trp Glu Glu Gly Ala Gly Gly Glu Tyr Leu Glu		
40 45 50 55		
cta agg aac cgg agg ctc gag aag ctg ccg ccg ccg gcg acc acg	366	
Leu Arg Asn Arg Arg Leu Glu Lys Leu Pro Pro Pro Pro Ala Thr Thr		
60 65 70		
agg agg tcg ggc ggg agg aaa gcg gca gcc gag gcc gcc gca act aag	414	
Arg Arg Ser Gly Gly Arg Lys Ala Ala Ala Glu Ala Ala Ala Thr Lys		
75 80 85		
gag gct gag gcg tcg tac ggg gag aac atg ctc gag ttg gag gcc atg	462	
Glu Ala Glu Ala Ser Tyr Gly Glu Asn Met Leu Glu Leu Glu Ala Met		
90 95 100		
gag agg att acc agg gag acg acg cct tgc agc ttg att aac acc cag	510	
Glu Arg Ile Thr Arg Glu Thr Thr Pro Cys Ser Leu Ile Asn Thr Gln		
105 110 115		
atg act agc act cct ggg tcc acg aga tcc agc gac tct tgc cac cgc	558	
Met Thr Ser Thr Pro Gly Ser Thr Arg Ser Ser His Ser Cys His Arg		
120 125 130 135		
agg gtg aac gct cct ccg gtg cac gcc gtc cca agt tcg agg gag atg	606	
Arg Val Asn Ala Pro Pro Val His Ala Val Pro Ser Ser Arg Glu Met		
140 145 150		
aat gag tac ttc gct gcc gaa cag cga cgc caa caa cag gat ttc att	654	
Asn Glu Tyr Phe Ala Ala Glu Gln Arg Arg Gln Gln Gln Asp Phe Ile		
155 160 165		
gac aag tac aac ttc gat cct gca aac gac tgc cct ctc cca ggc agg	702	
Asp Lys Tyr Asn Phe Asp Pro Ala Asn Asp Cys Pro Leu Pro Gly Arg		
170 175 180		
ttt gag tgg gtg aag cta gac t gatggattca gagggacgag agagcagcag	754	
Phe Glu Trp Val Lys Leu Asp		
185 190		
gcatggaatg gaatggaact cccccccgc tccctccaca ccacccacgc gttgtggcag	814	
aggcgcatatc cgctcgtgta gcttcgtttc tgctgtaaaa aaaaacttag tgttttagca	874	
tgtagcctta attggtcgtg tgttacagta cagaactgat gctgagttac aacaccctga	934	
tctggtcttg atctgatccc tcaactccaa tgtaaccctt aacagctcat tctgtaagga	994	
acctgtcacc ctgttacctg ttgctgaact aatgaagtag agctagataa tgacgtttta	1054	

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 <212> PRT
 <213> zea mays

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 35 40 45
 Ala Gly Gly Glu Tyr Leu Glu Leu Arg Asn Arg Arg Leu Glu Lys Leu
 50 55 60
 Pro Pro Pro Pro Ala Thr Thr Arg Arg Ser Gly Gly Arg Lys Ala Ala
 65 70 75 80
 Ala Glu Ala Ala Ala Thr Lys Glu Ala Glu Ala Ser Tyr Gly Glu Asn
 85 90 95
 Met Leu Glu Leu Glu Ala Met Glu Arg Ile Thr Arg Glu Thr Thr Pro
 100 105 110
 Cys Ser Leu Ile Asn Thr Gln Met Thr Ser Thr Pro Gly Ser Thr Arg
 115 120 125
 Ser Ser His Ser Cys His Arg Val Asn Ala Pro Pro Val His Ala
 130 135 140
 Val Pro Ser Ser Arg Glu Met Asn Glu Tyr Phe Ala Ala Glu Gln Arg
 145 150 155 160
 Arg Gln Gln Gln Asp Phe Ile Asp Lys Tyr Asn Phe Asp Pro Ala Asn
 165 170 175
 Asp Cys Pro Leu Pro Gly Arg Phe Glu Trp Val Lys Leu Asp
 180 185 190

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 agcgagaaga aggcagtgtc gcggcggcgt tccgtaag atg ggg aag tac atg cgc 176
 Met Gly Lys Tyr Met Arg
 1 5
 aag cgc agg ggg gcc gcg ggc gag ggg gtg gcc gca gtc gag gtc tcg 224
 Lys Arg Arg Gly Ala Ala Gly Glu Gly Val Ala Ala Val Glu Val Ser
 10 15 20
 cag gtc gtc ggc gtc cgg acg agg tcc agg tcc gcg gcg gcg acc ggc 272
 Gln Val Val Gly Val Arg Thr Arg Ser Arg Ser Ala Ala Ala Thr Gly

25	30	35	
ggc ggt gtc gcg aag gtc gct ccg ccg agg agg aag aag gcg ctg ctg			320
Gly Gly Val Ala Lys Val Ala Pro Pro Arg Arg Lys Lys Ala Leu Leu			
40	45	50	
ccc gcc gcg aac gtg acg acg tcg ggg gag cct ggt gcc gtg ggc gct			368
Pro Ala Ala Asn Val Thr Thr Ser Gly Glu Pro Gly Ala Val Gly Ala			
55	60	65	70
ggt ggt ggg gac ggc gga agc tgc tgc tac atc cac ctg cgg agc cgc			416
Gly Gly Gly Asp Gly Gly Ser Cys Cys Tyr Ile His Leu Arg Ser Arg			
75	80	85	
atg ctg ttc atg gca gca cct cag cag caa ccg tcg gcg gct ctg acg			464
Met Leu Phe Met Ala Ala Pro Gln Gln Gln Pro Ser Ala Ala Leu Thr			
90	95	100	
ccg gtg gag gct gct ggt gcg gca car caa ggc ggg gtg gtg gcg ctc			512
Pro Val Glu Ala Ala Gly Ala Ala Xaa Gln Gly Gly Val Val Ala Leu			
105	110	115	
gcg gct ggc ctc tcg cgt tgc tcc agc acg gcg tcg tcg gtg gac gtc			560
Ala Ala Gly Leu Ser Arg Cys Ser Ser Thr Ala Ser Ser Val Asp Val			
120	125	130	
ggg ggc cac gcc tgc cgc tcc gac gct gcg cct gcg gag gtt gac ggg			608
Gly Gly His Ala Cys Arg Ser Asp Ala Ala Pro Ala Glu Val Asp Gly			
135	140	145	150
gat cac gtc ccg gat gtc gtc acc gcg agc aac tcg ggg agc gtc ccg			656
Asp His Val Pro Asp Val Val Thr Ala Ser Asn Ser Gly Ser Val Pro			
155	160	165	
gac cgc gag agg aga gag acg acg cca tcg tcg agc cgg gcg cac ggc			704
Asp Arg Glu Arg Arg Glu Thr Thr Pro Ser Ser Ser Arg Ala His Gly			
170	175	180	
ggc gag ctc agc gat ctg gag tcg gat ctg gtg ggg cgg cag aag act			752
Gly Glu Leu Ser Asp Leu Glu Ser Asp Leu Val Gly Arg Gln Lys Thr			
185	190	195	
ggc tgc tcg tcg tcg ccg gcg aca aca aca tcg gct gcg gag ctg atc			800
Gly Cys Ser Ser Ser Pro Ala Thr Thr Thr Ser Ala Ala Glu Leu Ile			
200	205	210	
gtg ccg cca gca cag gag atc cag gaa ttc ttc gcg gcc gc			841
Val Pro Pro Ala Gln Glu Ile Gln Glu Phe Phe Ala Ala			
215	220	225	

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<220>
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 <223> Xaa = Any Amino Acid

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 Ser Ala Ala Ala Thr Gly Gly Gly Val Ala Lys Val Ala Pro Pro Arg
 35 40 45
 Arg Lys Lys Ala Leu Leu Pro Ala Ala Asn Val Thr Thr Ser Gly Glu
 50 55 60
 Pro Gly Ala Val Gly Ala Gly Gly Gly Asp Gly Gly Ser Cys Cys Tyr
 65 70 75 80
 Ile His Leu Arg Ser Arg Met Leu Phe Met Ala Ala Pro Gln Gln Gln
 85 90 95
 Pro Ser Ala Ala Leu Thr Pro Val Glu Ala Ala Gly Ala Ala Xaa Gln
 100 105 110
 Gly Gly Val Val Ala Leu Ala Ala Gly Leu Ser Arg Cys Ser Ser Thr
 115 120 125
 Ala Ser Ser Val Asp Val Gly Gly His Ala Cys Arg Ser Asp Ala Ala
 130 135 140
 Pro Ala Glu Val Asp Gly Asp His Val Pro Asp Val Val Thr Ala Ser
 145 150 155 160
 Asn Ser Gly Ser Val Pro Asp Arg Glu Arg Arg Glu Thr Thr Pro Ser
 165 170 175
 Ser Ser Arg Ala His Gly Gly Glu Leu Ser Asp Leu Glu Ser Asp Leu
 180 185 190
 Val Gly Arg Gln Lys Thr Gly Cys Ser Ser Ser Pro Ala Thr Thr Thr
 195 200 205
 Ser Ala Ala Glu Leu Ile Val Pro Pro Ala Gln Glu Ile Gln Glu Phe
 210 215 220
 Phe Ala Ala
 225